SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

2102-F-21-R-41

Name: Staum Dam **County**: Beadle
Legal Description: T113N- R59W- Sec14
Location from nearest town: 3 miles south, 1 mile east of Carpenter, SD

Dates of present survey: June 15, 2008
Date last surveyed: May 30, 2006

Primary Game and Forage Species	Other Species
Largemouth Bass	Black Bullhead
Bluegill	Hybrid Sunfish

PHYSICAL DATA

Surface Area: 46 acres
Maximum depth: 16 feet
Volume: Unknown
Contour map available: Yes
Watershed: 9,000 acres
Mean depth: 6.5
Shoreline length: 2.8 miles
Date mapped: 1970
Lake elevation observed during the survey: Full

Introduction

Staum Dam was constructed by the Works Progress Administration (WPA) around 1934. It was likely named for Edward Staum, who was the owner of the land the dam was constructed on. Staum, and other landowners, also provided public access easements for land underneath and surrounding the lake.

Ownership of Lake and Adjacent Lakeshore Property

Staum Dam is an artificial impoundment owned and managed by the South Dakota Department of Game, Fish, and Parks (GFP). Nearly the entire lake lies within a Game Production Area owned and managed by GFP.

Fishing Access

Staum Dam has a single lane, concrete boat ramp located on the southeast corner of the lake. The entire shoreline is publicly owned and accessible to shore fishing.

Field Observations of Water Quality and Aquatic Vegetation

The water in Staum dam was fairly clear during the 2008 survey with a Secchi depth measurement of 1.5 meters (59 in). Submergent vegetation, mostly sago pondweed (*Potamageton pectinatus*) and Chara (*Chara spp.*), was very dense in shallow water areas.

BIOLOGICAL DATA

Winterkill:

Staum Dam experienced a moderate winterkill in 2007-2008 that reduced the abundance of largemouth bass and bluegills. Black bullheads survived the winterkill and increased in abundance relative to other species.

Methods:

The fish population in Staum Dam was sampled by electrofishing at night for 80 minutes on June 15, 2008. Nearly the entire shoreline of the lake was sampled.

Results and Discussion:

Electrofishing Catch

Black bullhead (60.0%), largemouth bass (33.3%), and bluegill (6.7%) were sampled during this year's survey (Table 1).

Table 1. Total catch from 1.3 hours of nighttime electrofishing at Staum Dam, Beadle County, June 15, 2008.

Species	Number	%	CPUE[1]	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Black Bullhead	27	60.0	20.3	±10.0	66.7	92	8	107
Largemouth Bass	15	33.3	11.3	±6.0	97.2	100	46	100
Bluegill	3	6.7	2.3	±1.8	25.5	--	--	--

* Three years (2000, 2004, 2006)

Largemouth Bass

Management objective: Maintain a largemouth bass fishery with an electrofishing CPUE of at least 20.

Largemouth bass abundance has decreased due to the winterkill (Table 2). Staum Dam has good, consistent natural reproduction which should rebuild the population.

Table 2. Largemouth bass electrofishing CPUE, PSD, RSD-P and mean Wr for Staum Dam, Beadle County, 1999-2008.

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
CPUE		156.5				83.3		51.8		11.3
PSD		46				43		77		100
RSD-P		3				27		52		46
Mean Wr		122				102		104		100

[1] See Appendix A for definitions of CPUE, PSD, and mean Wr.

Bluegill

Management objective: Maintain a bluegill fishery with an electrofishing CPUE of at least 50 and RSD-18 of at least 20.

The bluegill population was also hurt by the winterkill and will need time to rebuild (Table 3).

Table 3. Bluegill electrofishing CPUE, PSD, RSD-18, RSD-P and mean Wr for Staum Dam, Beadle County, 1999-2008.

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
CPUE		0.0				10.5		66.0		2.3
PSD		--				36		7		--
RSD-18		--				0		5		--
RSD-P		--				0		0		--
Mean Wr		--				128		132		--

Black Bullhead

Management objective: Maintain a black bullhead population with an electrofishing CPUE of less than 100 per hour.

Although once over-populated with small bullheads, Staum Dam now supports a low density, high quality (PSD=92) population (Table 4 and Figure 2). Black bullheads were unaffected by the winterkill as CPUE has doubled since the last survey. Mean length and RSD-P decreased as older fish left the population (Table 4 and Figure 2).

Table 4. Black bullhead electrofishing CPUE, PSD, RSD-P and mean Wr for Staum Dam, Beadle County, 1999-2008.

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
CPUE		176.0				14.3		9.8		20.3
PSD		25				100		85		92
RSD-P		0				84		85		8
Mean Wr		--				124		109		107
Mean Length (mm)		--				327		336		260

MANAGEMENT RECOMMENDATIONS

1. Conduct another electrofishing survey in 2010 to monitor the fishery.

2. Consider stocking fingerling or adult largemouth bass and bluegill if natural reproduction fails to maintain population density at objective levels.

Table 6. Stocking record for Staum Dam, Beadle County, 1990-2008.

Year	Number	Species	Size
1992	6,000	Largemouth Bass	Med. Fingerling
1998	28	Largemouth Bass	Adult
	6,900	Largemouth Bass	Fingerling
1999	465	Largemouth Bass	Adult
	4,600	Largemouth Bass	Fingerling
2000	320	Bluegill	Fingerling
	380	Bluegill	Adult
2002	52,480	Bluegill	Fingerling
	860	Bluegill	Adult

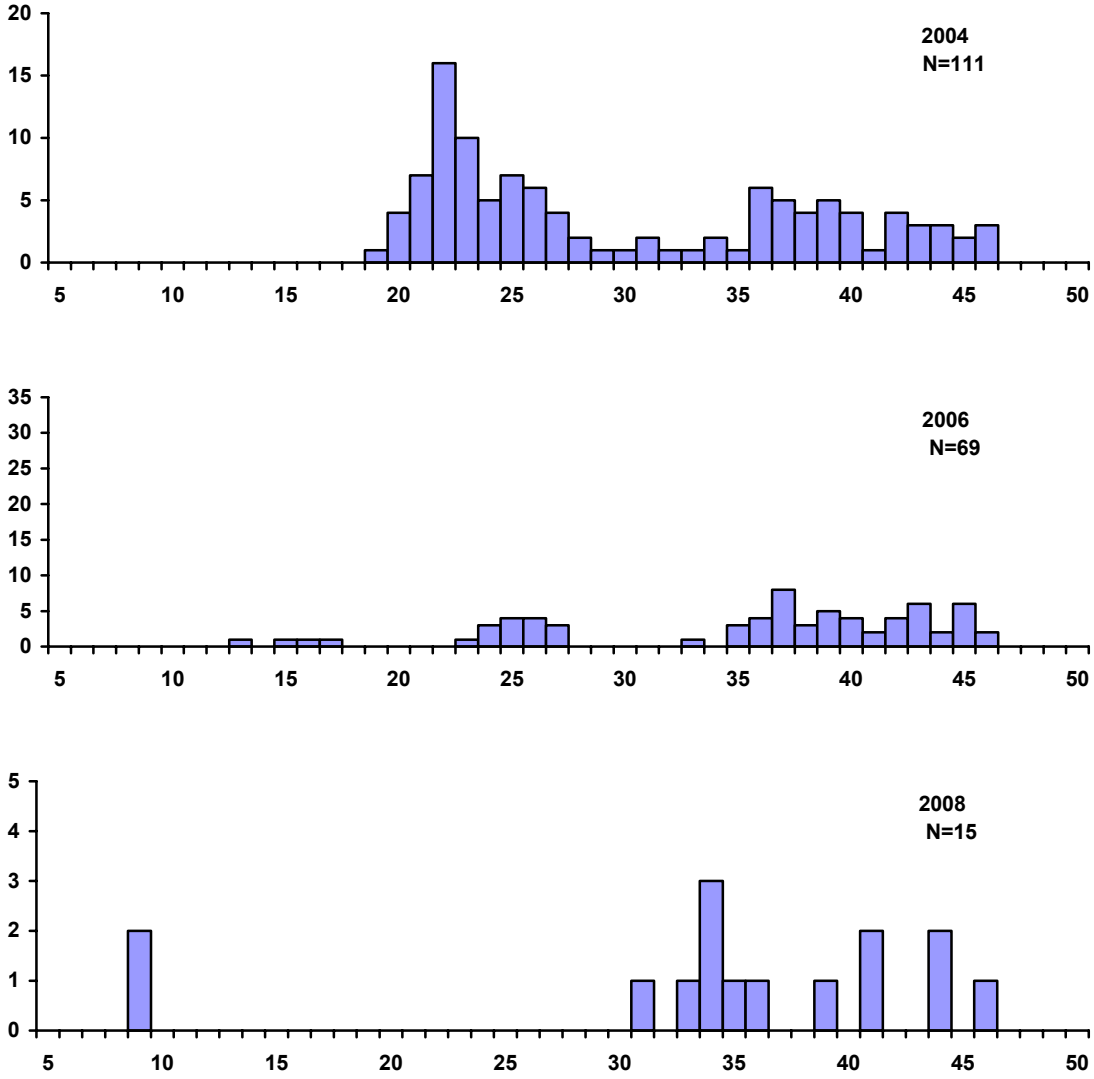

Figure 1. Length frequency histograms for largemouth bass sampled by electrofishing in Staum Dam, Beadle County, 2004, 2006 and 2008.

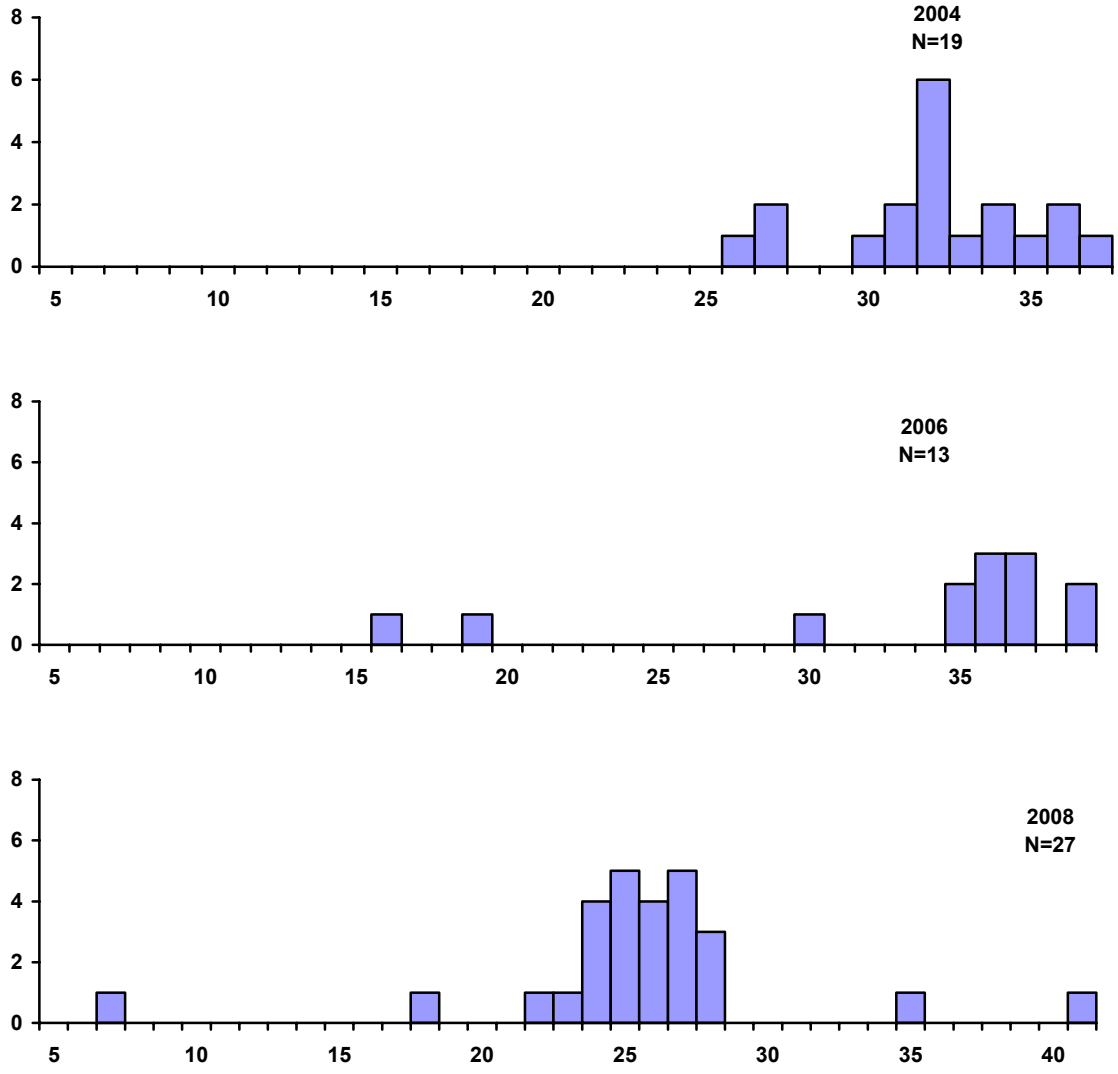

Figure 3. Length frequency histograms for black bullheads sampled by electrofishing in Staum Dam, Beadle County, 2004, 2006 and 2008.

Appendix A. A brief explanation of catch per unit effort (CPUE), proportional stock density (PSD), relative stock density (RSD) and relative weight (Wr).

Catch Per Unit Effort (CPUE) is the catch of animals in numbers or in weight taken by a defined period of effort. Can refer to trap-net nights of effort, gill-net nights of effort, catch per hour of electrofishing, etc.

Proportional Stock Density (PSD) is calculated by the following formula:

$$PSD = \frac{\text{Number of fish} > \text{quality length}}{\text{Number of fish} \geq \text{stock length}} \times 100$$

Relative Stock Density (RSD-P) is calculated by the following formula:

$$RSD\text{-}P = \frac{\text{Number of fish} > \text{preferred length}}{\text{Number of fish} \geq \text{stock length}} \times 100$$

PSD and RSD-P are unitless and usually calculated to the nearest whole digit.

Size categories for selected species found in Region 3 lake surveys, in centimeters.

Species	Stock	Quality	Preferred	Memorable	Trophy
Walleye	25	38	51	63	76
Sauger	20	30	38	51	63
Yellow perch	13	20	25	30	38
Black crappie	13	20	25	30	38
White crappie	13	20	25	30	38
Bluegill	8	15	20	25	30
Largemouth bass	20	30	38	51	63
Smallmouth bass	18	28	35	43	51
Northern pike	35	53	71	86	112
Channel catfish	28	41	61	71	91
Black bullhead	15	23	30	38	46
Common carp	28	41	53	66	84
Bigmouth buffalo	28	41	53	66	84
Smallmouth buffalo	28	41	53	66	84

For most fish, 30-60 or 40-70 are typical objective ranges for “balanced” populations. Values less than the objective range indicate a population dominated by small fish while values greater than the objective range indicate a population comprised mainly of large fish.

Relative weight (Wr) is a condition index that quantifies fish condition (i.e., how much does a fish weigh for its length). A Wr range of 90-100 is a typical objective for most fish species. When mean Wr values are well below 100 for a size group, problems may exist in food and feeding relationships. When mean Wr values are well above 100 for a size group, fish may not be making the best use of available prey.